0010

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor
Kathleen Clarke
Executive Director
Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

April 13, 2001

TO: [redacted] File

THRU: Susan M. White, Team Lead SMW

FROM: James D. Smith, Reclamation Specialist JDS

RE: Upper Pad Reclamation, Energy West Mining Company, Des Bee Dove Mine, [redacted]M01A

SUMMARY:

The mines in the Des-Bee-Dove area pre-date SMCRA, mine operations having been documented by the USGS in 1922. As the Beehive Mine and Little Dove Mines were developed, overburden was excavated and graded to make the mine pads and disturbed soils were neither classified nor salvaged; however, soil surveys were done in 1980, 1983, 1990, 2000, and 2001. Overburden was used to expand the pad area for the two mines and to divert a small drainage at the south end of the pad, and in the 1970's, bin walls and large boulders were placed below the pad to stabalize it and protect the Deseret Mine below. A narrow road was developed off the East Mountain Cattle Access Trail to provide access to a substation and water tank.

Utah Power and Light purchased the mines in 1972. The mines were temporarily sealed in 1987. In 1999 the portals were backfilled and - except for guardrails, a large drop-inlet structure, and several culverts - the surface facilities were removed.

What the permittee refers to as Phase I disturbed area is the Beehive and Little Dove pad and portal area and the tank – substation access road, plus the road from this upper area down to the Deseret Mine pad. Reclamation of this Phase I area will involve removal of remaining structures, restoration to approximate original contour (AOC), revegetation of the recontoured surface, and reestablishment of four minor drainages – three at the mine pad and one near the water tank pad.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Volume 8 of the Des-Bee-Dove MRP covers the geology of these mines in detail, but a brief section (600-Geology) describing the geology of the immediate area is included in Appendix XIV.

The Beehive and Little Dove Mines were developed in the Blind Canyon Seam. Dip of this seam is approximately 2° to the west or west- northwest in the Des-Bee-Dove area. The Des-Bee-Dove Mines lie in an area with complex series of normal faults that strike roughly north-south. The Beehive Mine removed coal between the Stump Flat fault on the east and the Maple Gulch fault on the west, and the Little Dove Mine exploited the coal between the Maple Gulch and Deer Creek Canyon faults: the Deer Creek fault separates the Des -Bee-Dove Mines from the Deer Creek and Wilberg Mines.

Samples collected from mines operated by PacifiCorp in both East and Trail Mountains indicate very low pyritic sulfur and high neutralization potential, so acid-mine drainage will not be a problem: analysis results are tabulated in Appendix A of section 600-Geology of Appendix XIV. Furthermore, because of the dip of the beds, the orientation of the portals and entries, and the dryness of the mines (these mines were dry and water from an outside source was required for dust suppression), post-mining gravity discharge will not occur.

The permittee states on page 7 of section 600 that there has been no exploration drilling within the area of the Des-Bee-Dove Phase I Reclamation.

Findings:

The geologic resource information in Volume 8 of the MRP and in Appendix XIV is considered adequate to meet the requirements of this coal mining rules.

RECLAMATION PLAN

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The proposed plan states that, because of the restricted site configuration, reconstruction of the drainages will dictate the actual extent to which fill can be placed (Section 553.110, page 15). This is a major concern at the Division, especially in drainage #3 (Drawings CS1817C and CS1814D) where the dip of the sandstone ledge above the Beehive portals will naturally divert water towards the placed fill and the drop from the ledge will concentrate erosive power at the base of the ledge. No purpose will be served in covering the entire cut to the top if water from drainage #3, or any drainage, erodes the fill or saturates the fill and causes it to slide.

Findings:

From the point of view of hydrology, the information in this section is considered adequate to meet the requirements of this coal mining rules.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Mining in the Des-Bee-Dove area predates SMCRA, going back to the late 19th century. It's not clear when the Beehive Mine was initially developed, but a shaft from the Deseret Mine up to the Beehive was constructed sometime in the 1950's to transport coal from the Beehive Mine to the surface by way of the Deseret Mine. Little Dove was constructed in the mid-1970's. The Beehive and Little Dove Mines each had three portals. The mines were temporarily sealed in 1987. In 1999 the portals were backfilled and the surface facilities removed. The planned reclamation will place additional fill and growth medium over the sealed portals. Water will not drain towards the sealed portals. The Little Dove portals and main entries are aligned almost directly downdip and no portion of the mine is at a higher elevation than the portals. The Beehive Mine portals and main entries are oriented close to strike of the coal seam but have a

slight downward slope; most of the mine is at an elevation lower than the portals and there is no direct flowpath from the higher areas to the portals.

Findings:

From the point of view of hydrology, the information in this section is considered adequate to meet the requirements of this coal mining rules

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

General

The Beehive and Little Dove Mines are in an unnamed canyon that is tributary to Grimes Wash. Hydrologic resources of the entire East Mountain area, which includes the Cottonwood/Wilberg, Deer Creek, and Des-Bee-Dove Mines, are described in Volume 9 – Hydrologic Section.

No ground-water resources have been documented in the Phase I Reclamation Area, the strata east of the Deer Creek Canyon fault being essentially dry.

The Phase I Reclamation Area is in a small, unnamed drainage that is tributary to Grimes Wash and part of the Cottonwood Canyon Creek drainage. The pad for the Beehive and Little Dove Mines was built across three small, ephemeral channels at the head of this drainage. These drainages normally flow only in response to storm events. The channel at the south end was diverted around the Beehive and Little Dove pad by a berm. Flow from the other two channels crosses the Beehive and Little Dove pad, enters a 48-inch culvert that carries the flow down to the main tipple pad, and from there reports to the sedimentation pond below the minesite. Another small drainage by the water tank was disrupted by construction of the road to the tank pad.

Rather than placing the engineered channels on top of the fill, as shown on Drawing CS1819A, they should be embedded into the fill, as shown on Plate 4 - 1 - sheet 2 of 5 in Volume 4 of the current MRP.

Channel and slope stability are more important than getting the fill all the way to the top of the cut slope. The channel and the filled slopes should be designed and built so that water cannot get from the channel into the fill and destabalize it. The proposed plan states that, because of the restricted site configuration, reconstruction of the drainages will dictate the actual extent to which fill can be placed (Section 553.110, page 15). This is a major concern at the Division, especially in drainage #3 (Drawings CS1817C and CS1814D) where the dip of the sandstone ledge above the Beehive portals will naturally divert water towards the placed fill and the drop from the ledge will concentrate erosive power at the base of the ledge. No purpose will be served in covering the entire cut to the top if water from drainage #3, or any drainage, erodes the fill or saturates the fill and causes it to slide.

Materials used to construct the channels need to be gradational from fine material at bottom to coarse at top, as shown in Drawing CS1819A and Plate 4 - 1 - sheet 2 of 5 in Volume 4. A grizzley will be needed on site. Coarse material needs to be placed so as to be stable, not just dumped.

Acid and toxic-forming materials

Samples collected from mines operated by PacifiCorp in both East and Trail Mountains indicate very low pyritic sulfur and high neutralization potential. Analysis results are tabulated in Appendix A of section 600-Geology of Appendix XIV.

Discharges into an underground mine

Mine openings are sealed, backfilled, and will covered with additional material during reclamation. There will be no surface drainage towards the buried portals and no discharge into underground mines.

Gravity discharges

The mines were temporarily sealed in 1987 and in 1999 the portals were backfilled. The planned reclamation will place additional fill and growth medium over the sealed portals. The Little Dove portals and main entries are aligned almost directly downdip and no portion of the mine is at a higher elevation than the portals. The Beehive Mine portals and main entries are oriented close to strike of the coal seam but have a slight downward slope; most of the mine is at an elevation lower than the portals and there is no direct flowpath from the higher areas to the portals. Furthermore, these mines were dry and required outside sources of water for dust control and other mine operations.

Water quality standards and effluent limitations

Monitoring of surface water will continue at the sedimentation pond outfall, UPDES permit UTG040022, which is the only monitoring site in the Des-Bee-Dove permit area. Monitoring will continue until release of the reclamation bond or an earlier appropriate date determined through consultation with the Division, and other local, state, and federal agencies.

The permittee commits that any discharges will be made in compliance with Utah and federal water-quality laws and regulations and with effluent limitations for coal mining promulgated by the EPA, as set forth in 40CFR Part 434.

Diversions

All diversions and drainage control structures constructed for mine operations will be removed. Flows will be returned to reconstructed channels at the approximate locations of the original, natural channels.

Calculations for peak storm discharge and volume used to design these constructed channels are in Appendix A. Calculations were done using the STORM program, which is available through OSMRE's TIPS program. An SCS Upland Curve 7 – ephemeral channel - was used. The rest of the parameters are given in pages 21 to 26 and in Appendix A. Results are summarized in Table 7-1 on page 26.

Calculations for channel design, including filter design and riprap sizing, were done using FlowMaster (version 5.13), based on Manning's equation. Calculation methodology for the filter design and riprap-sizing is explained on pages 26 through 32, and the results of the calculations are in Appendix A. The best combination of water velocity and channel width and depth was sought through an iterative process that tried to balance the costs of constructing narrower but deeper channels against installing additional riprap in shallower but wider channels. Channel dimensions, expected flow characteristics, and D_{50} riprap requirements are summarized in Table 7-2 on page 29, and trapezoidal channel designs results are Appendix A (it states on page 28 that the designs are in Appendix B – Des-Bee-Dove Phase 1 Reclamation Channel Design, but there is no Appendix B in the submittal nor in the Table of Contents.)

Channels 2 and 3 are to be lined with riprap. The equations used for the filter design and riprap-sizing are on page 30, and the results of the calculations are at the end of Appendix A. The Procedural Steps of Reclamation Table in Section 540 states that seive analysis will be done to assure riprap gradation meets design criteria. Materials for constructing these channels are to be obtained on-site. Riprap sizes should be varied rather than uniform. Riprap should be angular rather than rounded: boulders that will be excavated on-site may be more rounded than is

desirable and a method of breaking them into more angular material may be needed.

Drawing CS1819A shows schematic cross-sections of channels 2 and 3: these cross-sections show the filter and riprap materials placed on top of the fill. The elevation of the earthwork immediately adjacent to the channel should be above the uppermost edge of riprap placement, as shown on Plate 4 - 1 - sheet 2 of 5 in Volume 4 of the current MRP. The channels should be built to the size designed – that is, large enough to hold the design event entirely within the constructed, riprapped channel – then there should be a transition from the constructed channel to soil, rather than a visible, hard edge. This is visually more like the existing channels; promotes vegetation growth in the coarser material, which helps anchor it; and eliminates an edge that could facilitate and concentrate erosion parallel to the channel.

It is stated several times in the plan that boulders, acquired on-site, will be placed along the channels as erosion protection. Consideration should be given to using the largest boulders to create ledges to break the uniformity of the channel gradient. These should be imbedded into the fill and the filter and riprap placed around them, rather than placing these large boulders on top of the filter material, which would allow flow to go under them. Using these large boulders as artificial ledges would require extra attention to the construction of the streambed on the downstream side, and such measures as extra riprap or drop-pools might be needed.

Channel designs are based on an average gradiant along the length of the designed channel; however, the calculations and designs for channel 3 do not appear to account for the higher velocity and erosive power at the transition from the natural to the head of the constructed channel. The gradient down the face of the sandstone ledge immediately above the head of channel 3 is much greater that that used in the calculations (profile A – Drawing CS1817C), and flow may even form a waterfall with extreme conditions. A transitional structure such as a plunge pool or other method for dissipating the energy of the water flowing off this sandstone ledge is needed.

Experience has shown that channels built on fill are subject to many problems, including failure, if not constructed correctly. Acknowledging that it is the permittee who has the authority to control, direct, and supervise construction of the reclamation channels, the Division would like to have the permittee commit to notifying the Division in time for a Division hydrologist or other Division representative to make a field visit during placement of the filter and riprap.

Sediment control measures

Sediment will be controlled principally by restoring vegetative cover. Tackifier will be used on restored surfaces to temporarily control sediment runoff until vegetation becomes established. Surfaces will be roughened by deep gouging to retain sediment and moisture. Rock

litter on the surface will also aid in sediment control. If erosion is identified during routine monitoring or monitoring after precipitation events, silt fence will be installed and, if needed, the surface will be enhanced and reseeded.

The minor drainage near the water tank pad will be reestablished utilizing an excavator/backhoe. Riprap will not be needed, but boulders acquired on-site will be placed along the channel as erosion protection. The reclaimed area will be blended to resemble the section of the drainage above the access road.

The three drainages at the mine pad will be reestablished using an excavator/backhoe and will be blended to resemble the section of the drainage above the access road. Boulders acquired on-site will be placed along the channels as erosion protection. Channels have been designed to be capable of handling a 100-yr, 6-hour storm: designs are in Appendix A of Appendix XIV. Channels 2 and 3 will require riprap gradation, which is described in Riprap Gradation Calculations for Filter Design in Appendix A.

Siltation structures

All of the reclaimed areas will continue to report to the sedimentation pond below the minesite, which will be retained until the Division approves its removal. There is a commitment on page 33 in Section 763 to retain and maintain all temporary sedimentation structures, including the berm along the access road, until completion of sequenced reclamation beginning at the south end of the pad, proceeding north to the main portal pad area, and finally to the access road. The statement on page 18 in Section 752 - about maintenance of sediment control structures downstream of the Phase 1 area until Phase 2 reclamation in the fall of 2001 - needs to be clarified.

Findings:

The information in this section is not sufficient to meet the requirements of this coal mining rules. Prior to approval, the applicant must respond adequately to the following deficiencies:

R645-301-752.210 - Drawing CS1819A shows schematic cross-sections of channels 2 and 3: these cross-sections show the filter and riprap materials placed on top of the fill. The elevation of the earthwork immediately adjacent to the channel should be above the uppermost edge of riprap placement, as shown on Plate 4 - 1 - sheet 2 of 5 in Volume 4 of the current MRP. The channels should be built to the size designed – that is, large enough to hold the design event entirely within the constructed, riprapped channel – then ideally there should be a transition from the

constructed channel to soil, rather than a visible, hard edge. This is visually more like the existing channels; promotes vegetation growth in the coarser material, which helps anchor it; and eliminates an edge that could facilitate and concentrate erosion parallel to the channel. From a practical point-of-view, doing the work with large equipment usually will produce such a transition zone without effort as long as there is enough material for 'spillage' beyond the edges of the designed channel.

R645-301-121.200 - the statement on page 18 in Section 752 - about maintenance of sediment control structures downstream of the Phase 1 area until Phase 2 reclamation in the fall of 2001 - needs to be clarified.

R645-301-121.200 - trapezoidal channel designs results are in Appendix A - it states on page 28 that the designs are in Appendix B – Des-Bee-Dove Phase 1 Reclamation Channel Design, but there is no Appendix B in the submittal nor listed in the Table of Contents.

R645-301-121.200 – equation (1) on page 21 should show 'Q' on the left side rather than 'P'.

R645-301-742.312, -314 – channel designs are based on an average gradient along the length of the designed channel; however, the calculations and designs for channel 3 do not appear to account for the higher velocity and erosive power at the transition from the natural to the head of the constructed channel. The gradient down the face of the sandstone ledge immediately above the head of channel 3 is much greater that that used in the calculations (profile A – Drawing CS1817C), and flow may even form a waterfall with extreme conditions. A transitional structure such as a plunge pool or other method for dissipating the energy of the water flowing off this sandstone ledge is needed.

R645-301-742.312, -314 – riprap should be angular rather than rounded: boulders that will be excavated on-site may be more rounded than is desirable and a method of breaking them into more angular material may be needed.

R645-301-742.312, -314 – it is stated several times in the plan that boulders, acquired on-site, will be placed along the channels as erosion protection. Consideration should be given to using the largest boulders to create ledges to break the uniformity of the channel gradient. These should be imbedded into the fill with the filter and riprap placed around them, rather than placing them on top of the filter material, which would allow flow to go under them. Using these large

boulders as artificial ledges would require extra attention to the construction of the streambed on the downstream side, and such measures as extra riprap or drop-pools might be needed.

R645-301-742.310, -761 – acknowledging that it is the permittee who has the authority to control, direct, and supervise construction of the reclamation channels, the Division would like to have the permittee commit to notify the Division as far in advance as possible of when the filter and riprap will be installed so that a Division hydrologist or other Division representative could schedule a field visit during that part of the construction.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

A CHIA for the East Mountain area was updated in 1994. This modification of the Reclamation plan does not require modification or updating of the CHIA.

RECOMMENDATION:

This revision of the reclamation plan should not be approved until the listed deficiencies have been adequately resolved.

O:\015017.DBD\FINAL\JDS01A.DOC